

Innovative Disinfection Method to Prevent Foodborne Illness in Spaceflight, Phase I

Completed Technology Project (2018 - 2019)



Project Introduction

Anticipate Ventures (doing business as "Far UV Technologies") and its partners are proposing a currently unused and only recently available portion of the UltraViolet light spectrum (200-230nm Far UV) will be much more effective and safer than existing water, wipe, hydrogen peroxide, plasma chamber or conventional UV sanitation alternatives to address the emerging food borne biological threats, while being easier to use, lighter weight and more cost effective to implement while not requiring water and improving efficiency in the food supply chain by extending food shelf life.

Far UV sanitation is deceptively simple, yet it is a profound advance in disinfection that is applicable to any bacteria and/or virus. Far UV does not utilize environmentally challenging chemicals, does not inadvertently create super-bugs as antibiotics have more recently been shown to do and does not require water. Far UV is superior to existing legacy UV sanitation because legacy UV sanitation systems are ineffective at sanitizing objects that are exposed to UV-A (sunlight, fluorescent lights and other light sources) after sanitation and are a safety risk for direct human exposure. This means the legacy UV systems cannot sanitize food that requires post harvest handling in lighted facilities. Far UV is the first UV sanitation and the first to be safe for direct human exposure.

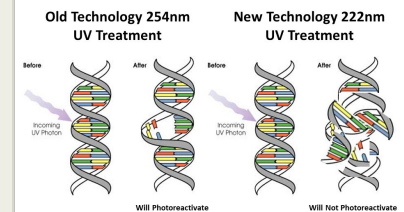
This project will demonstrate and validate an innovative new portable pathogen detection and Far UV disinfection system; selected foods will be tested and compared against control specimens to determine product safety and sensory technicians will determine the visual, nutritional and other shelf life impacts of the treatments. Far UV technologies will develop and fabricate fully-functional prototypes that are mature enough to operate and demonstrate in field tests, demonstrating commercial capability and maturity.

Anticipated Benefits

A Far UV solution can be used for surface disinfection of any biological contaminant on earth or in space. In addition to addressing potential food borne illness, a portable pathogen detection and Far UV treatment system could also be used in closed loop environments for medical applications (surgical or wound sterilization to ensure infections do not develop), waterless hand, body hygiene or laundry and biological containment and sterilization (augmenting or replacing existing processes).

Far UV solutions are being evaluated for a multitude of commercial purposes including but not limited to kitchen and other household disinfection applications, HVAC air purification, water or juice purification, food treatment and shelf life extension, medical applications (minimizing exposure to hospital acquired infections, acne treatment, athlete's foot treatment), waterless hand hygiene, waterless laundry and mold remediation.

Conventional UV Deactivation Versus Far UV Kill Mechanisms



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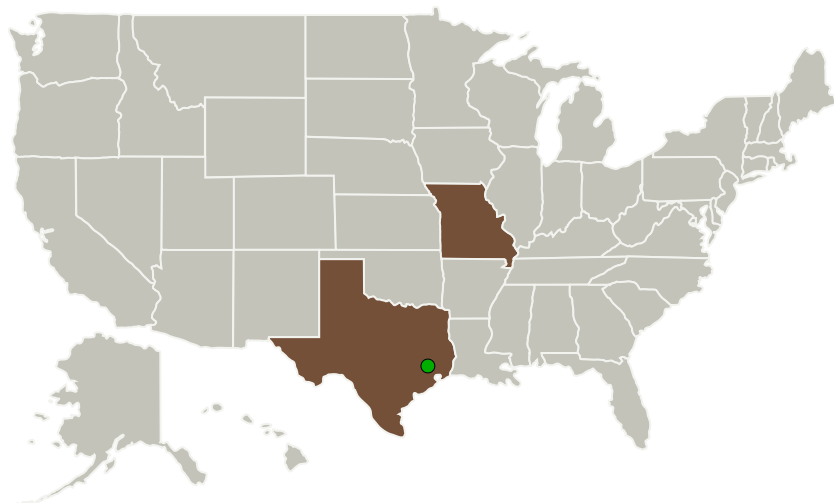
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Anticipate Ventures, LLC	Lead Organization	Industry	Kansas City, Missouri
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Missouri	Texas

Project Transitions

**July 2018:** Project Start**February 2019:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/141826>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Anticipate Ventures, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

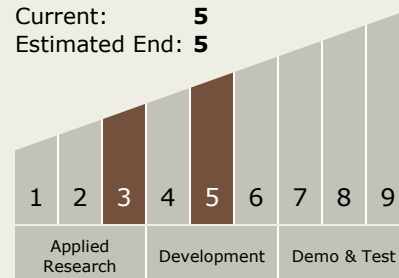
Carlos Torrez

Principal Investigator:

Patrick J Piper

Technology Maturity (TRL)

Start: **3**
 Current: **5**
 Estimated End: **5**

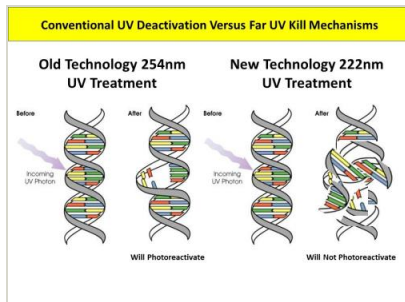


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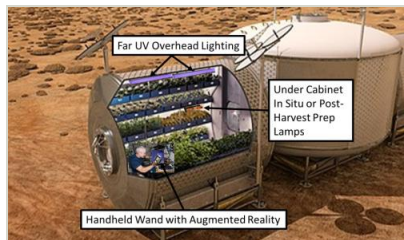


Images



Briefing Chart Image

Innovative Disinfection Method to Prevent Foodborne Illness in Spaceflight, Phase I
(<https://techport.nasa.gov/image/136041>)



Final Summary Chart Image

Innovative Disinfection Method to Prevent Foodborne Illness in Spaceflight, Phase I
(<https://techport.nasa.gov/image/130078>)

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.3 Human Health and Performance
 - └ TX06.3.5 Food Production, Processing, and Preservation

Target Destinations

The Moon, Mars, Earth